Effect of serotonin transporter gene and parental support interaction on adolescent's loneliness: A replication study

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Introduction

Heritability of loneliness (feeling of social isolation) is estimated around 37 to 55% (Boomsma et al., 2005). The serotonin transporter gene (5-HTTLPR) has been related to an oversensitivity to environmental stress and environmental threats. Social isolation might elicits such stress or threat responses (Eisenberger & Cole, 2012).

Positive parenting behaviors are related to less loneliness in adolescence (Hawkley & Cacioppo, 2010).

Study aim

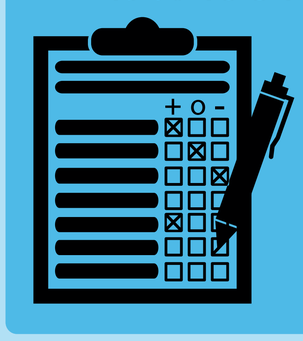
We replicated the van Roekel et al. (2010) study on the interaction of 5-HTTLPR and parental support on adolescent's loneliness. The replicability of such interactions has been questioned, as many replication attempts are non-significant (Duncan & Keller, 2011).

Method

1,116 Belgium adolescents

49% vs 51%

13.70 years (SD = 0.93)



Parental support: responsivity and hostility

5-HTTLPR dummy: 1) short-short & short-long, 2) long-long

Loneliness: Peer-related loneliness

Results

- Loneliness levels increased over time
  - Girls increased in loneliness, boys decreased
- Higher parental support was related to lower baseline loneliness
- No 5-HTTLPR main effect or 5-HTTLPR x Support interaction effect

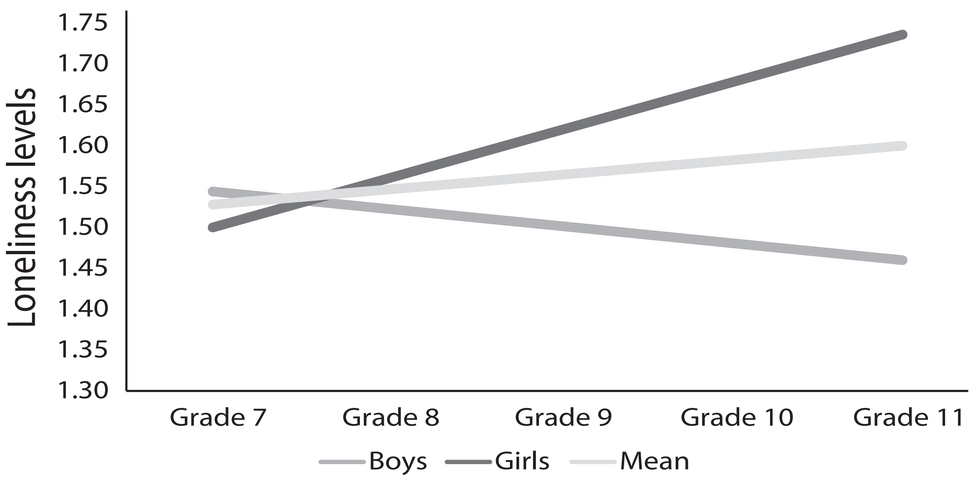


Figure 2. Loneliness levels over time for boys and girls seperately.

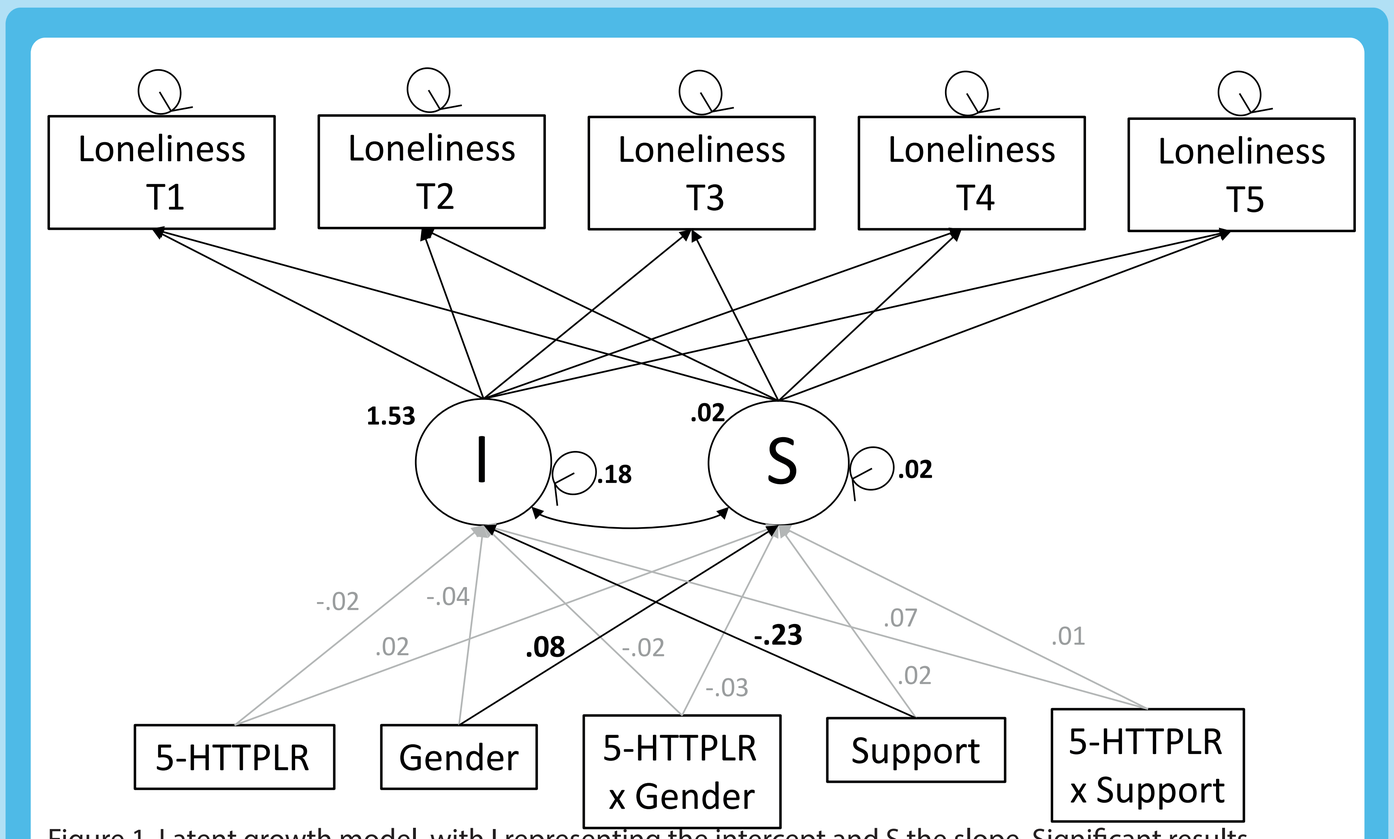


Figure 1. Latent growth model, with I representing the intercept and S the slope. Significant results are indicated by the black arrows.

Discussion

The buffering effect of parental support was replicated. This seems to be consistent with the broader literature (Galambos et al. 2003).

We replicated that girls score higher on loneliness than boys over time. These are the only two studies examining loneliness over time. Cross-sectional studies have led to contrasting results, with most studies finding no gender differences (Koenig & Abrams, 1999; Scharf, Wiseman & Farah, 2011).

Our non-replication of the genetic effects corresponds with the conclusion of two meta-analyses (Munafo, Durrant, Lewis & Flint, 2009; Rish, Herrell, Lehner, et al., 2009).

Conclusion

We did not replicate the main or interaction effects of 5-HTTLPR. It seems hard to find robust GxE effects using a single gene.

Effects for parental support and gender were replicated. These effects seem more robust.

Relevant literature

Galambos, N.L., Barker, E.T., & Almeida, D.M. (2003) Parents do matter: Trajectories of change in externalizing and internalizing problems in early adolescence. *Child Development, 74,* 578-94.

Hawkley, L.C, & Cacioppo, J,T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine, 40,* 218-27.

Duncan, L. E., & Keller, M. C. (2011). A critical review of the first 10 years of candidate gene-by-environment interaction research in psychiatry. *American Journal of Psychiatry, 168,* 1041-1049.

Munafo, M.R., Durrant, C., Lewis, G., & Flint, J. (2009). Gene × Environment interactions at the serotonin transporter locus. *Biological psychiatry, 65,* 211-9.

Risch, N., Herrell, R., et al. (2009). Interaction between the serotonin transporter gene (5-HTTLPR), stressful life events, and risk of depression: a meta-analysis. *Journal of the American Medical Association, 301,* 462-71.

van Roekel, E., Scholte, R. H. J., Verhagen, M., Goossens, L., & Engels, R. C. M. E. (2010). Loneliness in adolescence: Gene × Environment interactions involving the serotonin transporter gene. *Journal of Child Psychology and Psychiatry, 51,* 747-754.

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Extra information

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